

What is claimed is:

1. An apparatus for detecting particles located on an object comprising:
an emitter for irradiating lights to the particles, the object being disposed on a stage in
5 a direction substantially parallel to a surface of the object;
a driver for generating a relative motion between the emitter and the object for
scanning the surface of the object with the lights; and
a detector for detecting the lights emitted from the emitter or lights scattered from the
particle.

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2. The apparatus of claim 1, wherein the driver is in communication with the
emitter to move the emitter in a second direction which is different from the direction of the
emitted lights.

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3. The apparatus of claim 1, wherein the driver is connected to the stage for
moving the stage in a second direction which is different from the direction of the emitted
lights.

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4. The apparatus of claim 1, wherein the detector is located in a position which is
opposite to the emitter and which is centered on the object.

5. The apparatus of claim 1, wherein the detector is disposed over the object and
has a dome shape.

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6. The apparatus of claim 1, wherein the object comprises a bare wafer.

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7. An apparatus for detecting particles located on an object comprising:
an emitter for irradiating a first light and a second light to the particles, the object
being disposed on a stage in a first direction and a second direction which are substantially
parallel to a surface of the object;

a first driver for generating a relative [rotary]motion between the emitter and the
object for irradiating the first and second lights to the surface of the object;

a second driver for generating a relative motion between the emitter and the object for
scanning the surface of the object with the first and second lights;

a detector for detecting the first and second lights emitted from the emitter or the first and second lights scattered from the particles, and for producing a first and second detection signals and a relative position signal between the emitter and the object; and

5 a data processor for analyzing the first and second detection signals and the relative position signal between the emitter and the object from the detector to determine the position of the particles.

8. The apparatus of claim 7, further comprising a display for displaying the position of the particles.

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9. The apparatus of claim 7, wherein the object comprises a wafer.

10. The apparatus of claim 7, wherein the first driver is connected to the stage to rotate the stage, and the second driver is connected to the emitter to move the emitter in a third direction different from the first direction during irradiation of the first light, and in a fourth direction different from the second direction during irradiation of the second light, respectively.

11. The apparatus of claim 7, wherein the first driver is connected to the stage to rotate the stage, and the second driver is connected to the stage to move the stage in a third direction different from the first direction during the irradiation of the first light, and in a fourth direction different from the second direction during the irradiation of the second lights, respectively.

25 12. The apparatus of claim 7, wherein the first driver is connected to the emitter to rotate the emitter about the object, and the second driver is connected to the emitter to move the emitter in a third direction different from the first direction during the irradiation of the first light, and in a fourth direction different from the second direction during the irradiation of the second light, respectively.

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13. The apparatus of claim 12, further comprising a third driver for rotating the detector to a position centered on the object opposite to the emitter.

14. The apparatus of claim 7, wherein the first driver is connected to the emitter to rotate the emitter to a position centered on the object, and the second driver is connected to the stage to move the stage in a third direction different from the first direction during the irradiation of the first light, and in a fourth direction different from the second direction 5 during the irradiation of the second light, respectively.

15. The apparatus of claim 7, wherein the detector is located opposite to the emitter centered on the object.

10 16. The apparatus of claim 15, wherein the detector has a dome shape.

17. An apparatus for detecting particles located on an object comprising:
a first emitter for irradiating a first light to the particles on the object disposed on a stage in a first direction substantially parallel to a surface of the object;

15 a second emitter for irradiating a second light to the particles in a second direction substantially parallel to the surface of the object;

a first driver for generating a first relative motion between the first emitter and the object to scan the surface of the object by the first light;

20 a second driver for generating a second relative motion between the second emitter and the object to scan the surface of the object by the second light;

a detector for detecting the first and second emitted lights or the first and second lights scattered from the particles, and for generating first and second detection signals to determine positions of the particles; and

25 a data processor for analyzing the first and second detection signals to determine positions of the particles, the first and second detection signals comprising a first relative position signal between the first emitter and the object and a second relative position signal between the second emitter and the object from the detector.

18. The apparatus of claim 17, wherein the first driver is connected to the first 30 emitter to move the first emitter in a third direction different from the first direction, and the second driver is connected to the second emitter to move the second emitter in a fourth direction different from the second direction.

19. The apparatus of claim 17, wherein the first driver is connected to the stage to move the stage in a third direction different from the first direction, and the second driver is connected to the stage to move the stage in a fourth direction different from the second direction.

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20. A method for detecting particles located on an object comprising:
irradiating a light from an emitter to the particles on the object in a direction substantially parallel to a surface of the object;
generating a relative motion between the emitter and the object during irradiation of the light to scan the surface of the object with the light; and
detecting the light irradiated from the emitter or the light scattered from the particles.

21. The method of claim 20, wherein the emitter moves in a second direction different from the direction of the light during an irradiation of the light.

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22. The method of claim 20, wherein the object moves in a second direction different from the direction of the light during the irradiation of the light.

23. A method for detecting particles located on an object comprising:
irradiating a first light from an emitter to the particles on the object in a first direction substantially parallel to a surface of the object;
generating a first relative motion between the emitter and the object during irradiation of the first light to scan the surface of the object with the first light;
detecting the first light irradiated from the emitter or a first light scattered from the particle;
generating a relative motion between the emitter and the object;
irradiating a second light from the emitter to the particles in a second direction that is different from the first direction and is parallel to the surface of the object;
generating a second relative motion between the emitter and the object during irradiation of the second light to scan the surface of the object with the second light;
detecting the second light irradiated from the emitter or a second light scattered from the particles; and

analyzing first and second detection signals and a relative position signal between the emitter and the object created from detecting the first and second lights to recognize a position of the particles.

5 24. The method of claim 23, further comprising displaying the positions of the particles.

10 25. The method of claim 23, wherein generating the first relative motion further comprises moving the emitter relative to the object in a third direction different from the first direction during an irradiation of the first light, generating the relative rotary motion includes rotating the object, and generating the second relative motion includes moving the emitter relative to the object in a fourth direction different from the second direction during irradiation of the second light.

15 26. The method of claim 23, wherein generating the first relative motion further comprises moving the object relative to the emitter in a third direction different from the first direction during the irradiation of the first light, generating the relative rotary motion includes rotating the object, and generating the second relative motion includes moving the object relative to the emitter in a fourth direction different from the second direction during the 20 irradiation of the second light.

25 27. The method of claim 23, wherein generating the first relative motion further comprises moving the emitter relative to the object in a third direction different from the first direction during the irradiation of the first light, generating the relative rotary motion includes rotating the emitter about the object, and generating the second relative motion includes moving the emitter relative to the object in a fourth direction different from the second direction during the irradiation of the second light.

30 28. The method of claim 23, wherein generating the first relative motion further comprises moving the object relative to the emitter in a third direction different from the first direction during the irradiation of the first light, generating the relative rotary motion includes rotating the emitter about the object, and generating the second relative motion includes moving the object relative to the emitter in a fourth direction different from the second direction during the irradiation of the second light.

29. A method for detecting particles on an object comprising:
irradiating a first light from a first emitter to particles on the object in a first direction
substantially parallel to a surface of the object;

5 generating a first relative motion between the first emitter and the object in a third
direction different from the first direction during irradiation of the first light to scan the
surface of the object by the first light;

detecting the first light irradiated from the emitter or a first light scattered from the
particles;

10 irradiating a second light from a second emitter to the particle in a second direction
that is different from the first direction and is substantially parallel to the surface of the
object;

15 generating a second relative motion between the second emitter and the object in a
fourth direction different from the second direction during irradiation of the second light to
scan the surface of the object by the second light;

detecting the second light irradiated from the emitter or a second light scattered from
the particles; and

20 analyzing first and second detection signals to determine the positions of the particles,
the first and second detection signals comprising a relative position signal between the
emitter and the object created from detecting the first and second lights.

30. The method of claim 29, wherein generating the first relative motion further
comprises moving the first emitter relative to the object, generating the relative rotary motion
includes rotating the object, and generating the second relative motion further comprises
25 moving the second emitter relative to the object.

31. The method of claim 29, wherein generating the first relative motion further
comprises moving the object relative to the first emitter, and generating the second relative
motion further comprises moving the object relative to the second emitter.